Capital Markets Review Vol. 27, No. 2, pp. 89-102 (2019)

Effect of Standardization of Trading Board Lot on Abnormal Liquidity in Malaysian Stock Market

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Abstract: Research question: This study examines the liquidity reaction surrounding the standardization of trading board lot (STBL) event that was announced and implemented in 2003. **Motivation:** The STBL event called for a reduction in the trading lot size from 1000 and 200 units per lot to a uniform size of 100 units per lot. The event that affected 98% of Malaysian listed firms is claimed to have improved the market liquidity and increased trading activities. Hence, this study is motivated to examine the claim. **Idea:** Specifically, this study examines the liquidity effect surrounding the event announcement and implementation dates. We hypothesize that the STBL event has significant impact on market liquidity. **Data:** We have a sample of 869 firms. February 5, 2013 is taken as the event announcement date. Since the STBL was implemented in three phases, we have three implementation dates that affected different groups of firms. **Method/Tools:** To begin with, this study examines the liquidity effect using an event study methodology, followed by cross-sectional regression analyses. Liquidity is measured by (1) volume turnover, (2) bid-ask spread, and (3) Amihud illiquidity ratio to gauge the impact of the new policy on the market. **Findings:** There is a significant liquidity deterioration following the announcement of STBL due to the lack of information content. However, the implementation leads to significantly higher volume turnover in the first stage, while the bid-ask spread is significantly narrower in the second stage. In the last stage, we find significant improvement in all three liquidity measures. This is driven by an optimistic market outlook inspired by the positive liquidity effects observed in the earlier stages. **Contribution:** The findings confirm the significantly higher trading activities after the implementations of STBL, which further contribute to the limited literature on the minimum trading unit. The reduction of trading lot size leads to greater trading volumes. Lastly, the outcome of this study can be used as a reference for the regulators in evaluating the effectiveness of current policies or formulating future regulations.

Keywords: Minimum trading unit, lot size reduction, market microstructure, liquidity, event study, regulation.
JEL classification: G1, G14, G18

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Received 26 Mar 2019; Final revised 16 Sep 2019; Accepted 20 Sep 2019; Available online 30 Dec 2019.
To link to this article: https://www.mfa.com.my/cmr/v27_i2_a5/

1. Introduction

In 2003, the Kuala Lumpur Stock Exchange, KLSE (currently known as Bursa Malaysia) announced and implemented standard size of trading board lot, affecting stocks listed on its market. A board lot, also known as the minimum trading unit (MTU), is defined as the minimum number of shares per contract that is traded on a stock exchange[1]. Standardization of trading board lot (STBL) is a process of standardizing the size of shares per lot of a listed firm. The market microstructure reform sees a reduction in the unit of shares per lot from 1000 and 200 units to a standard size of 100 units that was completed in three different stages. By reducing the lot size, KLSE aims to; (1) facilitate investment in high-quality stocks that are relatively expensive, (2) increase liquidity of the stock market, (3) reduce odd lot holdings, and (4) attract new investors to the stock market (Bursa Malaysia, 2003).

Prior to the implementation of STBL, 98% of the stocks were traded in the multiple of 1000 units per lot, and around 1% have a board lot size of 200 units. This regulatory change affected most of the listed firms on KLSE at that time. The standardization was implemented in three exclusive stages. The first stage took place on April 7, 2003, affecting all 289 firms on the Second Board including firms under the Practice Note 4 (PN4) condition.[2,3] The second stage was completed on April 28, 2003, in which 106 firms on the Main Board under the Trading/Services sector started to trade using the new board lot size. The third stage was implemented on May 26, 2003, for the remaining 474 firms listed on the Main Board.

The standardization does not change the existing shareholders' net worth. The smaller lot size increases the number of shares outstanding one is holding, which is similar to a stock split practice (Ahn *et al.*, 2014). For new investment, standardization reduces the minimum monetary value required to purchase one lot of shares. Post-STBL, investors are only required to incur one-tenth (1/10) or one-fifth (1/5) of the earlier cost. *Ceteris paribus*, the smaller cost per lot provides investors with greater diversification potential for a given amount of capital, especially the retail investors with limited financial resources. Investments in high-priced stocks also become more affordable after the standardization. For example, before standardization, an investor requires a minimum of RM10,000 to buy one lot of shares trading at RM10, but after standardization, the minimum cost is reduced to RM1,000. The lower costs and smaller lot size give greater flexibility to investors in managing their portfolios.

This study investigates whether the objective to add liquidity to the stock market by reducing the lot size is achieved. Even though KLSE claims that trading volume increased significantly following the standardization practice, it has never been academically tested (Bursa Malaysia, 2003). Furthermore, using trading volume alone to represent liquidity would be partially accurate, as liquidity itself has many proxies and dimensions (Goyenko *et al.*, 2009), which needs to be addressed accordingly. Therefore, this study examines the liquidity reaction upon the announcement and implementation of STBL using three different measures of liquidity – volume turnover (trading activity), bid-ask spread (information asymmetry) and Amihud illiquidity ratio (price impact).

The standardization is a purely cosmetic event, and thus, its implementation should have no real effects on the market (Ahn *et al.*,2014). Large traders or institutional investors might

[1] We use the term board lot or lot size as they are more frequently used in Malaysia. Regardless. the term minimum trading unit is more common in academic literatures (see for example Ahn, 2014; Amihud *et al.*, 1999; and Gozluklu *et al.*, 2015).

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[2] The Second Board has merged with the Main Board on 8 August 2009, known as Main Market.

[3] Practice Note 4 (PN4) of Bursa Malaysia refers to a list of financially distress listed firms. These firms are in poor financial condition, and thus, required to provide proposal to restructure or to revive the firms.

react indifferently towards the new lot size, as they would care less about the lower minimum capital required to invest in one lot of shares. Regardless, the cheaper cost post-STBL might be attractive for small traders as it relaxes the monetary constraint they face before. Therefore, any significant market reaction observed surrounding the implementation dates might be driven by retail investors trading activities (Merton, 1987, Amihud *et al.*, 1999). Since the implementation process is completed in multiple stages affecting a unique set of stocks each time, we expect to see asymmetric reaction across each stage.

Our results show that there is a distinctive negative trend across all three liquidity measures surrounding the STBL announcement day. The lack of information provided during the announcement concerning the details of the standardization process has left the market in shrouds. Investors are constrained from making informed decisions, and the pending information translates into significantly lesser trading activity, wider spreads, and greater illiquidity in the post-announcement period.

The first stage of STBL implementation sees significantly more trading activities. However, the higher post-event Amihud illiquidity ratio suggest that even though the stocks are now more affordable, investors demand a higher return to compensate for the additional risk they have to bear by investing in the speculative stocks. In addition, the fact that this is an unprecedented event leads to the higher pre-event bid-ask spread, suggesting a greater dispersion of opinion across investors.

The second stage shows that there is no significant effect on trading activities or price impact, potentially due to the characteristics of the underlying firms. The stocks in the Trading/Services sector inherently are highly liquid, and thus, results from the liquidity-driven initiative are less apparent in these stocks. The smaller lot size post-standardization gives the small investors opportunities to impound their information in high-priced stocks. This leads to the significantly narrower post-STBL bid-ask spread which indicates less information asymmetry in the affected stocks.

The third stage sees the completion of the standardization process, affecting the remaining Main Board firms. We find that there are significant liquidity improvements across all three liquidity measures. The design of STBL implementation which was completed in multiple stages gives investors opportunities to learn how the market would react from the earlier stages. The positive reactions observed in the prior stages create an optimistic view of the completion of the third stage, which explains the significant results obtained. This also motivates investors to take strategic positions in the market before the implementation date, evident by the abnormally high trading activities in the pre-event window.

Our study contributes to the body of knowledge in several ways. First, our findings confirm that indeed, there are significantly higher trading activities after STBL implementation, which is aligned with the claim made by KLSE (Bursa Malaysia, 2003). Second, our study enriches the scarce literature on the minimum trading unit. Our findings show that lot size reduction in Malaysia is associated with greater trading volumes, which is consistent with the previous studies (Ahn *et al.*, 2014; Amihud *et al.*, 1999; Gozluklu *et al.*, 2015). Third, the outcome of our study can be used as a reference for the regulators in evaluating the effectiveness of current policies or formulating future regulations to strengthen and enhance the good organization of the Malaysian equity market.

This paper is organized as follow. Section 2 presents a review of the literature followed by Section 3 that outlines the research design and data, while Section 4 discusses the empirical results. The paper is concluded in Section 5.

2. Literature Review

Only limited number of empirical literatures that specifically discusses the effect of lot size changes on liquidity (see for example, Ahn, 2014, Ahn *et al.*, 2014, Amihud *et al.*, 1999), Gozluklu *et al.*, 2015, Hauser and Lauterbach, 2003, Isaka, 2014, and Isaka and Yoshikawa, 2013). Studies on lot size changes commonly use the investor base hypothesis proposed by Merton (1987) to explain the reaction observed. Merton (1987) introduces a model suggesting that firms with a higher number of investors have more information availability. He assumes that investors would only add securities that they have access to the information into their portfolio. This leads to a lower level of information asymmetry, and thus, the lower cost of capital and higher market value. Due to these potential benefits, managers have the motivation to expand their firm's investor base. Merton (1987) also suggests that the effect is greater in lesser-known firms and firms with higher firm-specific risk.

Amihud *et al.* (1999) study the event of lot size reduction in the Tokyo Stock Exchange (TSE) over the 1991-1996 period. They find stocks that reduced their lot size have greater trading volume, driven by the more dispersed ownership structure (i.e. greater investor base). Even though the smaller lot size increases the percentage of noise traders (i.e. small, individual investors), this also leads to greater liquidity and higher stock values. However, these firms might also suffer from greater agency cost and poorer corporate governance.

In addition, Ahn *et al.* (2014) use intraday trade and quote data from 1996 to 2005 to determine the effect of lot size reduction in the TSE. The higher frequency dataset allows them to analyze aspects of liquidity and market dynamics which could not be addressed using daily data. Their evidence shows that even though the lots size reduction widens the investor bases through the increased influx of individual, noisy traders, it could be detrimental to stock price informativeness. However, this is countered by the more aggressive trading by informed traders, leading to lower bid-ask spreads, which in turn, increases the market value of the firms.

In another market, Hauser and Lauterbach (2003) examine the event of lot size changes in the Tel Aviv Stock Exchange, which see an increase of lot size by 33% on September 1, 1998, and reduction of lot size by 62%-81% on December 1, 1999. Their results show that the decrease in lot size promotes trading activities and stock value, which is consistent with the model proposed by Merton (1987). However, this result is not uniform across all stocks. Stocks with greater initial tradability will benefit more, while those that suffer from the thin trading problem will gain less, or even worsened following the lot size reduction.

Similarly, Isaka and Yoshikawa (2013) also find that the positive effect from lot size reduction varied across stocks in the TSE – it is more pronounced in low-visibility firms and less noticeable in high-visibility firms. This relationship holds despite using different measures of liquidity. They suggest that a firm’s cost of capital and value may be affected by investors' degree of familiarity with its stock, hence the asymmetry reaction. Gozluklu *et al.* (2015) investigate the effect of reducing lot size in Borsa Italiana from multiple sizes to one unit per lot. They find improvement in the market liquidity after the reduction, indicated by a decrease in the bid-ask spread at the first five levels of the order book. Conversely, Isaka (2014) find that firm liquidity does not change significantly following lot size reductions. He concludes that the expanded investor base does not affect returns through any changes in liquidity, but only influences the long-run stock returns.

In general, empirical studies on lot size find the reduction in the minimum trading unit widens the investor base from the increased proportion of small individual traders. This leads to greater information availability, which increases both liquidity and stock values (Verousis *et al.*, 2018). From the literature, we hypothesize that liquidity is significantly affected by the STBL event.

3. Data and Methodology

3.1 Sample Selection

Our sample comprises firms affected by the standardization event in 2003 that are collected from four different dates; (1) February 5 (Announcement date), (2) April 7 (the first stage of implementation), (3) April 28 (the second stage of implementation), and (4) May 26 (the third and final stage of implementation). The first announcement of the event was made by Datuk Mohd Azlan Hashim, the executive chairman of KLSE back then, on Friday, January 31, 2003. On the announcement day, the market was closed and remained closed for five consecutive days starting from January 31 (Friday) until February 4 (Tuesday) due to a long weekend. The market resumed trading on February 5 (Wednesday).

Since the first announcement was made on a non-trading day, February 5 is taken as the event day (Day 0), which is the next-available trading day after the long holiday. There were 1,120 counters listed on KLSE across all trading boards on that day, of which 871 are unique firms and 249 are derivative securities. The latter are excluded since the focus of our study is the main firms. Another two firms are excluded due to insufficient data, resulting in 869 firms in the final sample.

In addition, we investigate the implementation effect of SBTL on the market. The implementation process was completed in three stages across three different dates, affecting one exclusive group of stocks at a time. The first stage affected 289 firms listed on the Second Board of KLSE, while the second stage affected 106 Trading/Services stocks listed on the Main Board. The final stage of the implementation affected the remaining 474 firms on KLSE. The chronology of STBL and final sample used in our study are summarized in Table 1.

Table 1: Sample for the STBL event

Event Date (Day 0)	Affected firms	Number of firms
5 February 2003 (Announcement day)	Firms listed on KLSE	869
7 April 2003 (First stage)	Firms listed on the Second Board	289
28 April 2003 (Second stage)	Firms listed on the Trading/Services sector of the Main Board	106
26 May 2003 (Third stage)	Remaining firms of the Main Board	474

Notes: The figures stated in the table are based on the number of firms involved in the standardization event, represents the main counter of a firm and excludes any derivative securities. The figures also exclude all MESDAQ firms, and firms in the financial and utilities industries.

These implementation dates are utilized as another set of events which allows us to compare the liquidity reaction surrounding the announcement day and the implementation days. In this study, we use three measurements of liquidity: (1) volume turnover (see for example; Datar *et al.*, 1998; Chordia *et al.*, 2001). (2) bid-ask spread (see for example; Amihud and Mendelson, 2006; Lesmond, 2005) and (3) Amihud illiquidity ratio (see for example; Acharya and Pedersen, 2005; Amihud and Mendelson, 2006)

For brevity in explaining the methodology, we use the term liquidity to represent these measures. The formulas and descriptions for each measure are presented in Table 2.We use an event study methodology to determine the liquidity reaction surrounding the events of interest. The event days are labeled as Day 0, which are February 5 (announcement), April 7 (first stage), April 28 (second stage), and May 26 (third stage).

This study emphasizes on the results of short event windows surrounding the event day to avoid capturing effect, if any from other liquidity-sensitive event. In addition, it would be more accurate to deduce that the reaction observed within these windows is linked to the STBL event. Our longest event window is set at 21 days, which starts 10 days prior to the event day to 10 days after (-10, +10). In addition, we also use other event windows such as 5

days prior to 5 days after (-5,+5), 3 days prior to 3 days after (-3,+3), 1-day surrounding the event day (-1,+1), the event day to 3 days after (0,+3), the event day to 5 days after (0,+5), 10 days prior to the event day (-10,-1), the event day and the first day after (0,+1), and 2 days after until 10 days after (+2,+10).

Table 2: Variables and measurements

Variables	Measurements
$VOL_{i,t}$	Volume turnover (in percentage) of firm *i* on day *t*. It is used to proxy for liquidity from the trading activity perspective. It measures how frequent firm *i* shares being traded on day *t*, relative to its number of common shares outstanding on the same day. Larger values indicate greater liquidity. $$Volume\ turnover_{i,t}\ (\%) = \frac{Volume\ turnover_{i,t}\ (unit)}{Common\ shares_{i,t}\ (unit)} \quad (1)$$
$SPR_{i,t}$	Bid-ask spread of firm *i* on day *t*. It is used to proxy for liquidity from the information asymmetry perspective. It measures the gap (in percentage) between the lowest selling price (ask) and the highest buying price (bid) of firm *i* shares at closing time on day *t*. Smaller values indicate greater liquidity. $$Spread_{i,t} = \frac{Ask_{i,t} - Bid_{i,t}}{Ask_{i,t}} \quad (2)$$
$ILQ_{i,t}$	Amihud illiquidity ratio of firm *i* on day *t*. It is used to proxy for liquidity from the price impact perspective. It measures how much the share price of firm *i* will be impacted by every ringgit of its shares traded on day *t*. Smaller values indicate greater liquidity. $$Illiquidity_{i,t} = \frac{\left\lvert \ln \frac{P_{i,t}}{P_{i,t-1}} \right\rvert}{Volume\ turnover_{i,t}(in\ RM)} \quad (3)$$

Since the emphasis is on short event window, referring to Chae (2005), our estimation window is set from 40 days to 11 days prior to each event day (-40, -11). To calculate the normal liquidity, we use the mean-adjusted model. The normal liquidity ($\overline{LIQ_i}$) is estimated for each stock by finding the average value of each measure from the estimation window. The normal liquidity is then used to calculate the daily abnormal liquidity in the event window. The formulas to compute normal and abnormal liquidity are presented in equation 4 and equation 5 respectively.

$$\overline{LIQ_i} = \frac{1}{n}\sum_{t=-11}^{-40} LIQ_i \quad (4)$$

$$ALIQ_{i,t} = LIQ_{i,t} - \overline{LIQ_i} \quad (5)$$

where,

$ALIQ_{i,t}$ = abnormal liquidity of firm *i* on day *t*
$LIQ_{i,t}$ = liquidity of firm *i* on day *t*
n = number of observations of liquidity of firm *i* from day -40 to day -11

Next, we calculate the average abnormal liquidity of all firms on day *t* ($AALIQ_t$) and the variance of average abnormal liquidity on day *t* ($Var_{AALIQ(t)}$),

$$AALIQ_t = \frac{1}{n}\sum_{i=1}^{n} ALIQ_{i,t} \quad (6)$$

$$Var_{AALIQ(t)} = \frac{1}{n^2}\sum_{i=1}^{n}\left(ALIQ_{i,t} - AALIQ_t\right)^2 \quad (7)$$

where *n* is the number of observations of abnormal liquidity of all firms on day *t.* We then calculate the cumulative average abnormal liquidity ($CAALIQ_t$) of all firms from day t_1 until t_2. Lastly, we compute the variance of cumulative average abnormal liquidity of all firms from day t_1 until t_2 ($Var_{CAALIQ(t1,t2)}$).

$$CAALIQ(t_1, t_2) = \sum_{t=t_1}^{t_2} AALIQ_t \quad (8)$$

$$Var_{CAALIQ(t_1,t_2)} = \frac{1}{n^2}\sum_{i=1}^{n}\left(CALIQ_{i,t_1,t_2} - CAALIQ(t_1, t_2)\right)^2 \quad (9)$$

where,

$CALIQ_{i,t_1,t_2}$ = cumulative abnormal liquidity of firm *i* from day t_1 until t_2

$CAALIQ(t_1, t_2)$ = cumulative average abnormal liquidity of all firms from day t_1 until t_2

n = number of observations of cumulative abnormal liquidity from day t_1 until t_2

4. Results and Discussion

This section discusses the effect of standardization events on liquidity by analyzing the average abnormal liquidity (AALIQ) and cumulative average abnormal liquidity (CAALIQ) surrounding the event days. Liquidity is measured using volume turnover (VOL), bid-ask spread (SPR) and Amihud illiquidity ratio (ILQ). Therefore, the abbreviations used to discuss the results are tailored accordingly.

4.1 STBL Announcement

Table 3 presents the results of abnormal liquidity and cumulative abnormal liquidity for the liquidity measures over a 21-day period surrounding the announcement day. Our findings show that there is a significant increase in trading activities over this period ($CAAVOL_{-10,+10}$=0.0060). We further dissect the event window into three smaller windows to capture the pre-event [-10,-1], on event day [0,+1], and post-event [+2,+10] effects. We find significant improvements in volume turnover and bid-ask spread in the pre-event period, indicated by $CAAVOL_{-10,-1}$=0.0082 and $CAASPR_{-10,-1}$=-0.0450, respectively. Regardless, volume turnover has decreased significantly on the event day ($CAAVOL_{0,+1}$=-0.0005) and post-event ($CAAVOL_{+2,+10}$=-0.0017), signifying lower trading activities following the announcement. Results remain consistent even when liquidity is measured using bid-ask spread and Amihud illiquidity. Both suggest significant deterioration in liquidity on the event day ($CAASPR_{0,+1}$=0.0116) and post-event ($CAAILQ_{+2,+10}$=0.0313) periods.

Figure 1 confirms that there is a negative trend after the announcement day (Day 0) across all measures. This is illustrated by the decreasing trend in CAAVOL and an increasing trend in both CAASPR and CAAILQ. This phenomenon can be explained using the lack of information arguments. On the announcement date itself, the market does not have sufficient information about STBL such as when and how the standardization would be implemented. This situation constraints investors from making informed decisions and forcing them to shy away from the market, which is shown by the negative CAAVOL from Day 0 onwards. In addition, this has heightened the level of uncertainties in the market, a reflected by the greater level of information asymmetry (bid-ask spread) and price impact (Amihud illiquidity) in the post-event period.

Table 3: Abnormal liquidity surrounding the announcement day

Panel A: Event day

Event day	Date	n	AAVOL	n	AASPR	n	AAILQ
-10	17/01/2003	670	0.0013***	742	-0.0081***	497	-0.0009
-9	20/01/2003	656	0.0012***	738	-0.0080***	481	-0.0024**
-8	21/01/2003	704	0.0020***	736	-0.0136***	567	-0.0065***
-7	22/01/2003	703	0.0019***	747	-0.0132***	554	-0.0078***
-6	23/01/2003	650	0.0009***	742	-0.0102***	532	-0.0061***
-5	24/01/2003	659	0.0005***	738	-0.0061***	543	-0.0040***
-4	27/01/2003	645	0.0003***	744	0.0036**	580	0.0207
-3	28/01/2003	635	0.0007***	740	0.0006	534	-0.0024**
-2	29/01/2003	611	0.0004*	737	0.0043***	476	-0.0015
-1	30/01/2003	594	0.0000	729	0.0038**	426	0.0257
0	5/02/2003	570	-0.0005***	746	0.0085***	411	0.0001
1	6/02/2003	601	-0.0001	740	0.0033**	440	-0.0010
2	7/02/2003	610	-0.0002	736	0.0002	456	0.0133
3	10/02/2003	637	-0.0003**	737	0.0052***	503	0.0267
4	11/02/2003	600	-0.0005***	744	0.0022	421	0.0006
5	13/02/2003	605	-0.0005***	743	0.0046***	443	0.0043
6	14/02/2003	598	-0.0005**	732	0.0018	412	0.0034
7	17/02/2003	601	0.0000	735	0.0030**	461	-0.0006
8	18/02/2003	587	-0.0002*	730	-0.0010	405	0.0008
9	19/02/2003	606	-0.0002	735	-0.0033***	408	0.0017
10	20/02/2003	591	0.0003	742	-0.0034***	414	-0.0007

Panel B: Event windows

Event windows	CAAVOL	CAASPR	CAAILQ
(-10, +10)	0.0060***	-0.0249	0.0379
(-5, +5)	-0.0002	0.0290***	0.0533
(-3, +3)	-0.0001	0.0250***	0.0388
(-1, +1)	-0.0005	0.0152***	0.0168
(0, +1)	-0.0005**	0.0116***	-0.0007
(-10, -1)	0.0082***	-0.0450***	0.0079
(+2, +10)	-0.0017*	0.0088	0.0313**
(0, +3)	-0.0010**	0.0167***	0.0276*
(0, +5)	-0.0018**	0.0232***	0.0293*

Notes: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

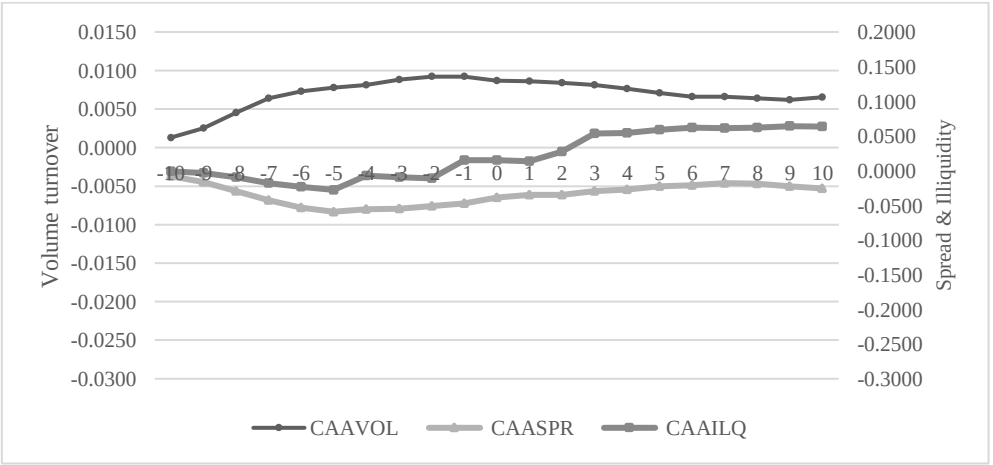

Figure 1: The cumulative average abnormal liquidity over a 21-day period surrounding the announcement day

4.2 STBL implementation

4.2.1 First Stage

Table 4 shows the results of abnormal liquidity surrounding the first stage, which affected firms listed on the Second Board. The results show that there is a significant increase in the trading volume surrounding the event day ($CAAVOL_{0,+1}$=0.0019) and the shorter post-event windows ($CAAVOL_{0,+3}$=0.0025; $CAAVOL_{0,+5}$=0.0032). This is illustrated by the steady increase in CAAVOL after Day 0 depicted in Figure 2. The bid-ask spread surrounding the first stage shows that the result is significantly positive only for the pre-event window ($CAASPR_{-10,-1}$=0.0636), followed by a sideways movement from Day -2 onwards. As for the Amihud illiquidity ratio, the pre-event and event day windows are not significant. However, the overall and post-event windows are significantly positive, as indicated by $CAAILQ_{-10,+10}$=0.0898 and $CAAILQ_{+2,+10}$=0.0648, respectively. This is illustrated by the sharp increase in CAAILQ from Day 0 onwards (see Figure 2).

Table 4: Abnormal liquidity surrounding the first stage

Panel A: Event day

Event day	Date	n	AAVOL	n	AASPR	n	AAILQ
-10	24/03/2003	164	-0.0002	240	0.0086***	125	0.0328
-9	25/03/2003	134	-0.0005	239	0.0096***	102	-0.0002
-8	26/03/2003	152	0.0001	243	0.0082***	108	0.0066
-7	27/03/2003	134	-0.0005	237	0.0081**	97	0.0023
-6	28/03/2003	142	-0.0005*	240	0.0067**	105	-0.0075*
-5	31/03/2003	157	-0.0003	240	0.0102***	115	-0.0001
-4	1/04/2003	148	-0.0004*	242	0.0122***	105	0.0016
-3	2/04/2003	153	0.0000	240	0.0040	104	-0.0024
-2	3/04/2003	170	0.0003	240	-0.0025	118	-0.0053
-1	4/04/2003	170	0.0004	239	0.0004	120	-0.0067*
0	7/04/2003	179	0.0009*	234	0.0071**	152	0.0043
1	8/04/2003	182	0.0014***	239	-0.0057**	146	0.0243
2	9/04/2003	176	0.0005	239	0.0012	135	0.0457*
3	10/04/2003	170	0.0004	234	-0.0002	116	0.0002
4	11/04/2003	161	0.0005	238	0.0008	114	0.0070
5	14/04/2003	157	0.0004	242	0.0060*	128	0.0145
6	15/04/2003	164	0.0004	242	0.0005	125	0.0216
7	16/04/2003	177	0.0004	240	-0.0017	127	0.0051
8	17/04/2003	173	0.0003	241	-0.0058*	120	0.0053
9	18/04/2003	171	0.0003	239	-0.0055*	106	0.0228
10	21/04/2003	155	0.0001	243	0.0000	105	-0.0031

Panel B: Event windows

Event windows	CAAVOL	CAASPR	CAAILQ
(-10, +10)	0.0033	0.0601	0.0898***
(-5, +5)	0.0031	0.0325	0.0490*
(-3, +3)	0.0029*	0.0041	0.0379
(-1, +1)	0.0020**	0.0016	0.0162
(0, +1)	0.0019***	0.0012	0.0217
(-10, -1)	-0.0009	0.0636***	0.0119
(+2, +10)	0.0025	-0.0044	0.0648**
(0, +3)	0.0025**	0.0022	0.0481*
(0, +5)	0.0032**	0.0088	0.0579**

Notes: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Our results suggest that there are greater trading activities among the affected firms in the post-event period. Regardless, the implementation also sees a higher level of information asymmetry and greater price impact for the Second Board stocks after the lot

size reduction. Our results suggest that STBL implementation has put the affected stocks in the spotlight – the center of attraction in the market. The fact that this event is something that has never been done before in the market, the surprise factor (i.e. investors' anticipation) over the impact of the new policy is stronger. This is reflected by the significantly higher trading activity especially in the first few days after the implementation took place. This also explains the wider bid-ask spread in the pre-event period, suggesting a more diverse opinion in the market. The significant positive post-event CAAILQ suggest that despite the higher trading activity recorded, investors would participate only when the price movement is large enough – as reflected by the absolute value of return in the Amihud illiquidity measure. This is consistent with the risk-return trade-off theory which suggests that investors would require greater return for the greater risk they have to bear, which in this case are the speculative stocks.

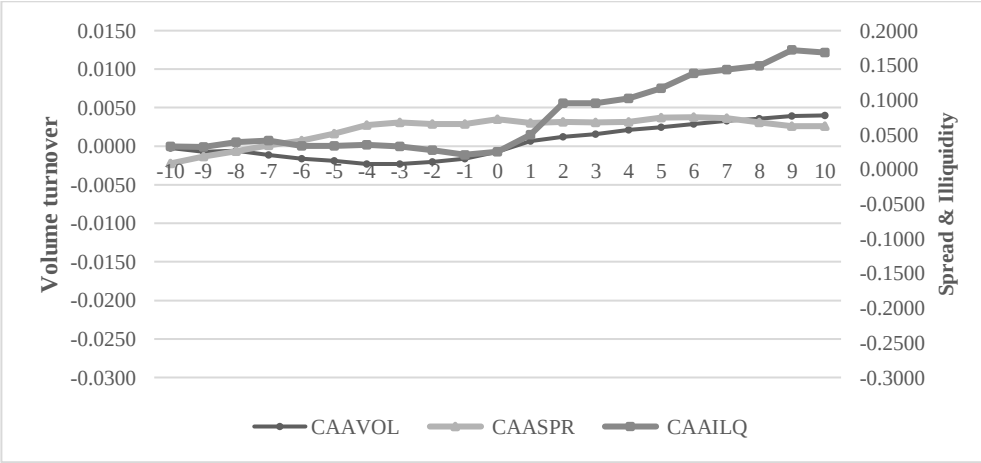

Figure 2: The cumulative average abnormal liquidity over a 21-day period surrounding the first stage

4.2.2 Second Stage

Table 5 shows the results of abnormal liquidity surrounding the second stage that affected firms listed on the Trading/Services sector of the Main Board. In general, Trading/Services firms are larger, more expensive, and highly liquid. Our results show that there is a negative trend in the trading activities from Day -10 until Day -3, followed by a positive trend from Day +2 onwards and then nullified the effect observed from the preceding trend (see Figure 3). This also explains why none of our selected event windows on CAAVOL report a significant result. On the contrary, all windows show significant negative CAASPR, indicating greater liquidity and lesser information asymmetry problem for the Trading/Services stocks after STBL implementation. This is evident by the consistent negative trend from Day -10 to Day +10 shown in Figure 3.

As for the Amihud illiquidity ratio, even though there is a positive shift in illiquidity from Day 0 until Day +1, it is not statistically significant, and neither do any of the event windows tested. In short, there is no significant difference in trading activity and illiquidity surrounding the second stage. This might be due to the fundamental characteristics of stocks in the Trading/Services sector itself, which inherently have higher trading activity and are less illiquid than the rest of the market. Regardless, there is a significant reduction in bid-ask spread surrounding the affected stocks, suggesting a smaller level of information asymmetry. The lower minimum capital required to trade post-STBL allows retail investors

Table 5: Abnormal liquidity surrounding the second stage

Panel A: Event day

Event day	Date	n	AAVOL	n	AASPR	n	AAILQ
-10	14/04/2003	85	-0.0002**	95	0.0011	47	0.0009
-9	15/04/2003	89	-0.0002**	97	-0.0044**	63	0.0010
-8	16/04/2003	85	-0.0002***	100	-0.0034**	57	-0.0005
-7	17/04/2003	87	-0.0002**	97	0.0014	51	-0.0003
-6	18/04/2003	86	-0.0001	95	-0.0059***	59	-0.0003
-5	21/04/2003	83	-0.0001	96	-0.0026	53	-0.0010
-4	22/04/2003	83	-0.0002**	96	-0.0038*	48	-0.0003
-3	23/04/2003	92	-0.0001	98	-0.0031	63	-0.0010**
-2	24/04/2003	88	0.0005	95	-0.0046**	67	-0.0005
-1	25/04/2003	88	0.0001	97	-0.0015	51	-0.0007*
0	28/04/2003	83	-0.0001	97	-0.0075***	54	0.0004
1	29/04/2003	91	0.0001	92	-0.0069***	62	0.0150
2	30/04/2003	88	0.0004	97	-0.0037	57	0.0032
3	2/05/2003	83	0.0000	96	-0.0035	53	-0.0002
4	5/05/2003	92	0.0000	98	-0.0047**	61	-0.0011
5	6/05/2003	91	0.0001	92	-0.0048**	59	-0.0004
6	7/05/2003	92	0.0000	94	-0.0004	52	-0.0013**
7	8/05/2003	87	-0.0002	96	-0.0022	52	0.0000
8	9/05/2003	87	0.0000	96	-0.0059**	53	0.0026
9	12/05/2003	90	0.0000	94	-0.0052**	62	-0.0010**
10	13/05/2003	90	0.0001	91	-0.0053**	66	0.0006

Panel B: Event windows

Event windows	CAAVOL	CAASPR	CAAILQ
(-10, +10)	-0.0003	-0.0710***	0.0091
(-5, +5)	0.0006	-0.0433***	0.0082
(-3, +3)	0.0007	-0.0286***	0.0100
(-1, +1)	0.0001	-0.0151***	0.0109
(0, +1)	0.0000	-0.0138***	0.0125
(-10, -1)	-0.0007	-0.0250*	-0.0015
(+2, +10)	0.0004	-0.0330***	0.0013
(0, +3)	0.0003	-0.0204***	0.0121
(0, +5)	0.0004	-0.0290***	0.0103

Notes: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

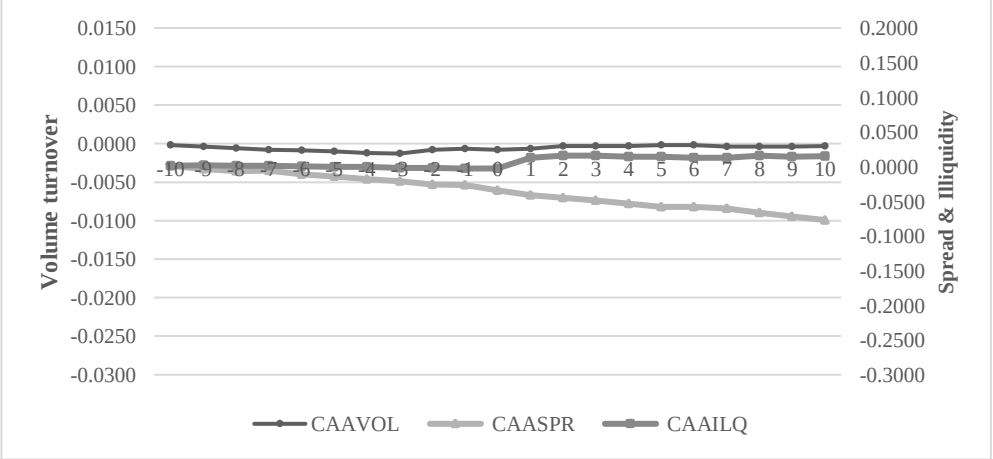

Figure 3: The cumulative average abnormal liquidity over a 21-day period surrounding the second stage

to participate in these stocks, which previously might be too costly. Consequently, their private information is impounded in the stock price through their trading activities, which accordingly caused the bid-ask spreads to shrink.

4.2.3 Third Stage

Table 6 shows the results of abnormal liquidity surrounding the third stage. This is also the last and final stage of the implementation, affecting the remaining firms listed on the Main Board of KLSE. The third stage also hosted the largest number of affected stocks – 474 firms across various industries.

Table 6: Abnormal liquidity surrounding the third stage

Panel A: Event day

Event day	Date	n	AAVOL	n	AASPR	n	AAILQ
-10	8/05/2003	344	-0.0001	413	-0.0030**	196	-0.0136
-9	9/05/2003	360	0.0002	402	-0.0018	223	-0.0030*
-8	12/05/2003	363	0.0000	406	-0.0026*	234	-0.0099
-7	13/05/2003	366	0.0001	402	-0.0051***	237	-0.0142*
-6	16/05/2003	368	0.0000	401	-0.0022	256	-0.0200
-5	19/05/2003	368	0.0003**	403	-0.0032*	254	0.0097
-4	20/05/2003	367	0.0002*	404	-0.0044***	227	-0.0247*
-3	21/05/2003	367	0.0002*	400	-0.0030	233	-0.0035
-2	22/05/2003	362	0.0000	405	-0.0038*	244	-0.0211*
-1	23/05/2003	386	0.0010***	403	-0.0054***	315	-0.0011
0	26/05/2003	394	0.0009***	403	-0.0095***	301	-0.0176*
1	27/05/2003	385	0.0004***	402	-0.0071***	284	-0.0096*
2	28/05/2003	399	0.0009***	401	-0.0096***	334	-0.0100
3	29/05/2003	392	0.0009***	399	-0.0116***	291	0.0006
4	30/05/2003	404	0.0013***	403	-0.0112***	309	-0.0245**
5	2/06/2003	385	0.0005***	395	-0.0090***	287	-0.0139
6	3/06/2003	396	0.0008***	405	-0.0100***	277	-0.0130
7	4/06/2003	384	0.0006***	398	-0.0093***	265	-0.0281*
8	5/06/2003	406	0.0016***	397	-0.0107***	357	-0.0150*
9	6/06/2003	406	0.0009***	408	-0.0111***	281	-0.0213*
10	9/06/2003	409	0.0022***	401	-0.0161***	342	-0.0255**

Panel B: Event windows

Event windows	CAAVOL	CAASPR	CAAILQ
(-10, +10)	0.0121***	-0.1401***	-0.1813**
(-5, +5)	0.0062***	-0.0730***	-0.0759**
(-3, +3)	0.0040***	-0.0471***	-0.0414**
(-1, +1)	0.0021***	-0.0211***	-0.0211**
(0, +1)	0.0012***	-0.0162***	-0.0220**
(-10, -1)	0.0016***	-0.0326***	-0.0559**
(+2, +10)	0.0092***	-0.0923***	-0.1075**
(0, +3)	0.0030***	-0.0359***	-0.0270*
(0, +5)	0.0047***	-0.0545***	-0.0540**

Notes: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

STBL implementation occurs in multiple stages over a short period of time – only 49 calendar days from the first stage to the completion of the final stage. This design allows investors to observe the market reaction in the earlier stages and strategize accordingly. The positive liquidity effects observed surrounding the earlier implementation stages (i.e. greater trading volume and narrower spread in the first and second stage respectively) would lead investors to deduce similar trend would be seen in the third stage. Therefore, they would positively anticipate that the affected stock will soon enjoy greater liquidity. Since liquidity

is priced, investors are motivated to enter the market several days prior to the event day to gain strategic positions.

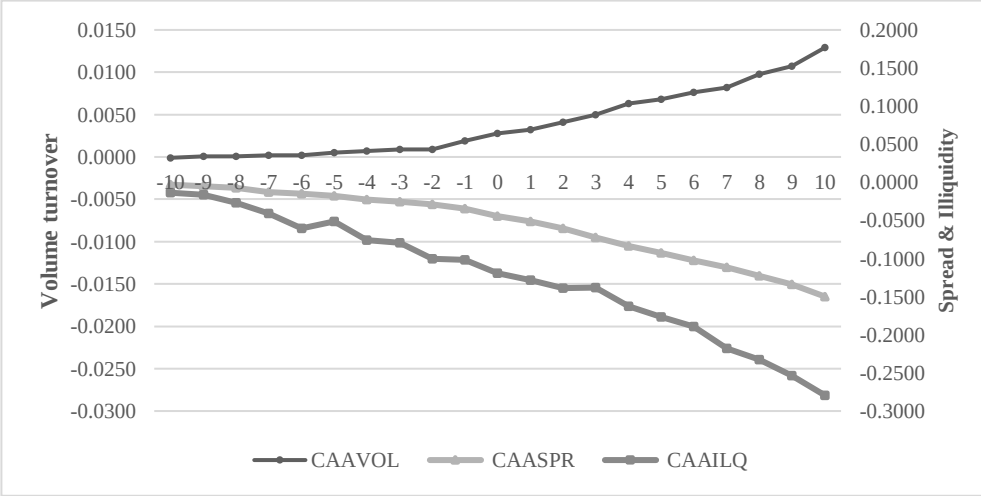

Figure 4: The cumulative average abnormal liquidity over a 21-day period surrounding the third stage

The results show that there is a significant improvement in liquidity in all three measures and across the event windows that we used. We find that the positive trend of AAVOL has started from Day -5, which is one whole week prior to the actual implementation date (see Figure 4). This indicates that the trading activities are abnormally high even before the lot size is reduced, which confirms with the strategic trading notion. In addition, most of the daily AASPR and AAILQ are significantly negative in the 21-day event window even in the pre-event days (see Table 6). This is also confirmed by the distinct trends shown in Figure 4, which illustrates a consistently negative trend for both CAASPR and CAAILQ starting from Day -10 until Day +10.

5. Conclusion

This paper examines the effects of STBL announcement and implementation in 2003 on the liquidity of Malaysian listed stocks using three different liquidity proxies – volume turnover, bid-ask spread, and Amihud illiquidity ratio. Our paper generally contributes to the literature on market microstructure by examining the impact of introducing an exogenous shock to improve liquidity in an emerging stock market. The new policy affects all firms listed on the KLSE, excluding the MESDAQ counters. Specifically, our research enriches the literature on lot size reduction by analyzing the liquidity reaction following the STBL implementation.

We find a significant deterioration in all three measures of liquidity following the announcement of STBL. We believe this is due to the lack of information provided during the announcement, which inhibits investors from making an informed trading decision. This is reflected by the significantly lower trading volume, wider spreads, and higher illiquidity surrounding the STBL announcement. As for the implementation stages, we find that trading volume is significantly positive in the first stage, and the bid-ask spread is significantly reduced in the second stage. During the third stage, we find significant improvement in all three liquidity measures, which is believed to be driven by the positive market expectation. We also find evidence of strategic trading in the third stage, as indicated by the significant liquidity reaction prior to the actual implementation date.

Overall, our findings are consistent with the claim made by Bursa Malaysia (2003) that the trading activities have increased significantly after the implementation of STBL. However, the results are less pronounced for stocks that are already actively traded. In addition, our results using other liquidity measures show that the KLSE's objective to add liquidity to the stock market via the lot size reduction is realized. For future studies, we suggest using a longer horizon to compare whether the positive liquidity reaction observed following the lot size reduction is permanent. In addition, it is also worth to investigate whether the effect of lot size reduction is driven by firm-specific characteristics. Future researchers could also conduct a comparative analysis by examining the market reaction surrounding STBL with other liquidity-centric policy, such as the introduction of a new tick size regime.

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